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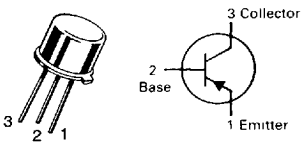
2N3634 thru 2N3637

CASE 79-04, STYLE 1
TO-39 (TO-205AD)



GENERAL PURPOSE TRANSISTORS

PNP SILICON

MAXIMUM RATINGS

Rating	Symbol	2N3634 2N3635	2N3636 2N3637	Unit
Collector-Emitter Voltage	V_{CEO}	−140	−175	Vdc
Collector-Base Voltage	V_{CBO}	−140	−175	Vdc
Emitter-Base Voltage	V_{EBO}	−5.0		Vdc
Collector Current — Continuous	I_C	−1.0		Adc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	1.0 5.71		Watt mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	5.0 28.6		Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +200		°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	175	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	35	°C/W

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ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted.)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage(1) (I_C = −10 mAdc, I_B = 0)	2N3634, 2N3635 2N3636, 2N3637	$V_{(BR)CEO}$	 −140 −175	 — —	Vdc
Collector-Base Breakdown Voltage (I_C = −100 μAdc, I_E = 0)	2N3634, 2N3635 2N3636, 2N3637	$V_{(BR)CBO}$	 −140 −175	 — —	Vdc
Emitter-Base Breakdown Voltage I_E = −10 μAdc, I_C = 0)		$V_{(BR)EBO}$	−5.0	—	Vdc
Collector Cutoff Current (V_{CB} = −100 Vdc, I_E = 0)		I_{CBO}	—	−100	nAdc
Emitter Cutoff Current (V_{EB} = −3.0 Vdc, I_C = 0)		I_{EBO}	—	−50	nAdc
ON CHARACTERISTICS					
DC Current Gain (I_C = −0.1 mAdc, V_{CE} = −10 Vdc)	2N3634, 2N3636 2N3635, 2N3637	h_{FE}	 40 80	 — —	—
(I_C = −1.0 mAdc, V_{CE} = −10 Vdc)	2N3634, 2N3636 2N3635, 2N3637		 45 90	 — —	
(I_C = −10 mAdc, V_{CE} = −10 Vdc)(1)	2N3634, 2N3636 2N3635, 2N3637		 50 100	 — —	
(I_C = −50 mAdc, V_{CE} = −10 Vdc)(1)	2N3634, 2N3636 2N3635, 2N3637		 50 100	 150 300	
(I_C = −150 mAdc, V_{CE} = −10 Vdc)(1)	2N3634, 2N3636 2N3635, 2N3637		 25 50	 — —	
Collector-Emitter Saturation Voltage(1) (I_C = −10 mAdc, I_B = −1.0 mAdc) (I_C = −50 mAdc, I_B = −5.0 mAdc)		$V_{CE(sat)}$	 — —	 −0.3 −0.5	Vdc
Base-Emitter Saturation Voltage(1) (I_C = −10 mAdc, I_B = −1.0 mAdc) (I_C = −50 mAdc, I_B = −5.0 mAdc)		$V_{BE(sat)}$	 — −0.65	 −0.8 −0.9	Vdc
SMALL-SIGNAL CHARACTERISTICS					
Current-Gain — Bandwidth Product (V_{CE} = −30 Vdc, I_C = −30 mAdc, f = 100 MHz)	2N3634, 2N3636 2N3635, 2N3637	f_T	 150 200	 — —	MHz

ELECTRICAL CHARACTERISTICS (continued) (T_A = 25°C unless otherwise noted.)

Characteristic		Symbol	Min	Max	Unit
Output Capacitance (V_{CB} = −20 Vdc, I_E = 0, f = 1.0 MHz)		C_{obo}	—	10	pF
Input Capacitance (V_{EB} = −1.0 Vdc, I_C = 0, f = 1.0 MHz)		C_{ibo}	—	75	pF
Input Impedance (I_C = −10 mAdc, V_{CE} = −10 Vdc, f = 1.0 kHz)	2N3634, 2N3636 2N3635, 2N3637	h_{ie}	 100 200	 600 1200	ohms
Voltage Feedback Ratio (I_C = −10 mAdc, V_{CE} = −10 Vdc, f = 1.0 kHz)		h_{re}	—	3.0	X 10^{-4}
Small-Signal Current Gain (I_C = −10 mAdc, V_{CE} = −10 Vdc, f = 1.0 kHz)	2N3634, 2N3636 2N3635, 2N3637	h_{fe}	 40 80	 160 320	—
Output Admittance (I_C = −10 mAdc, V_{CE} = −10 Vdc, f = 1.0 kHz)		h_{oe}	—	200	μmhos
Noise Figure (I_C = −0.5 mAdc, V_{CE} = −10 Vdc, R_S = 1.0 k ohms, f = 1.0 kHz)		NF	—	3.0	dB

SWITCHING CHARACTERISTICS

Turn-On Time	(V_{CC} = −100 Vdc, V_{BE} = 4.0 Vdc,	t_{on}	—	400	ns
Turn-Off Time	I_C = −50 mAdc, I_{B1} = I_{B2} = −5.0 mAdc)	t_{off}	—	600	ns

(1) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

FIGURE 1 — JUNCTION CAPACITANCE VARIATIONS

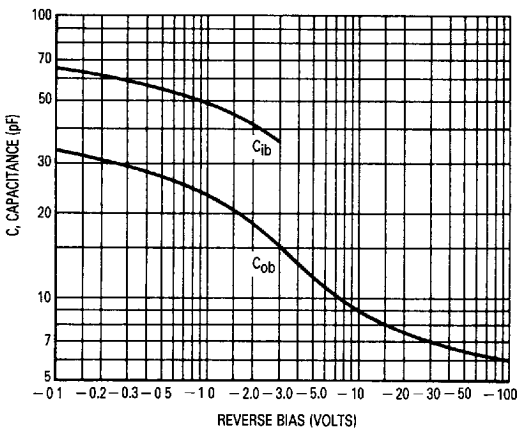

FIGURE 2 — GAIN-BANDWIDTH PRODUCT

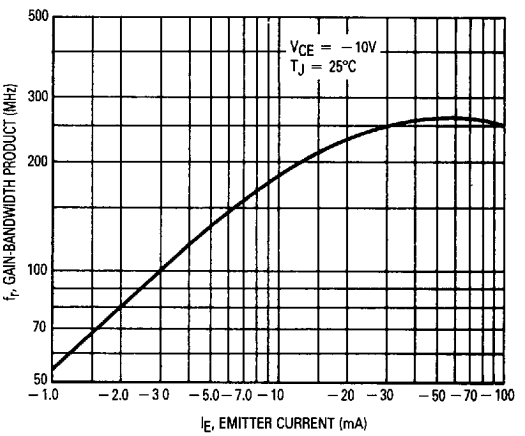

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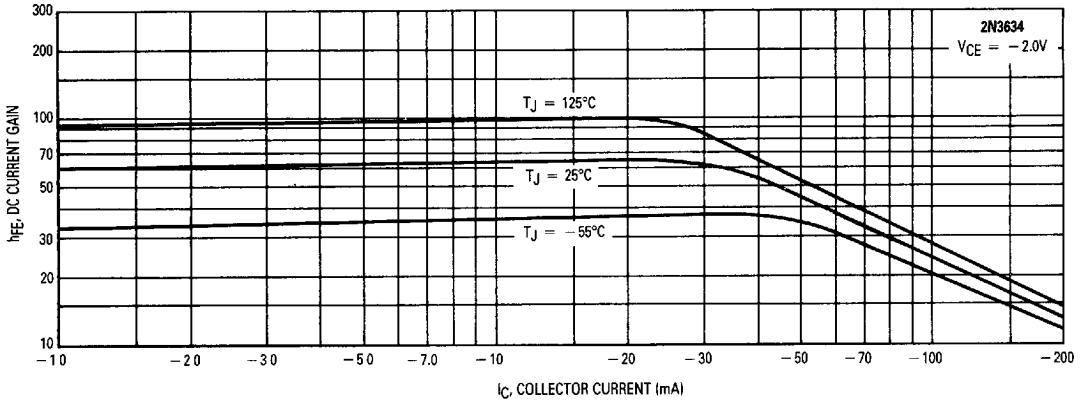
FIGURE 3 — CURRENT GAIN CHARACTERISTICS versus JUNCTION TEMPERATURE

2N3634



2N3637

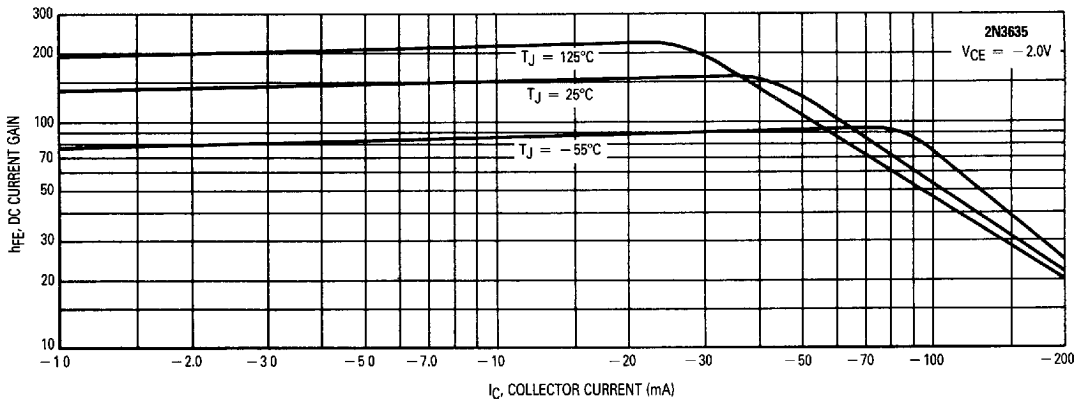


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FIGURE 4 — CURRENT GAIN CHARACTERISTICS versus COLLECTOR EMITTER VOLTAGE

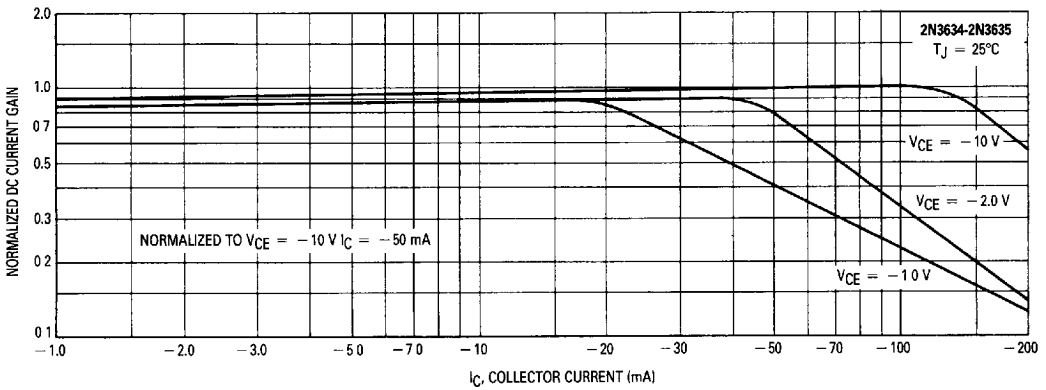
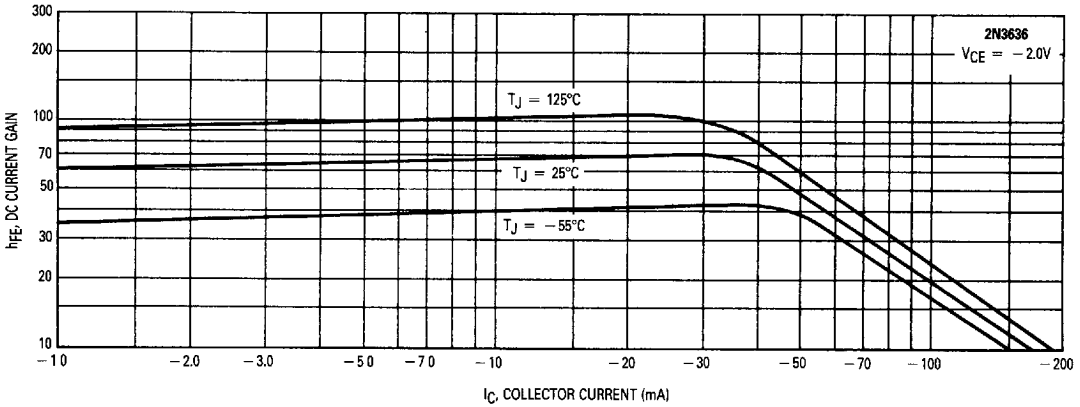


FIGURE 5 — CURRENT GAIN CHARACTERISTICS versus JUNCTION TEMPERATURE

2N3636



2N3637

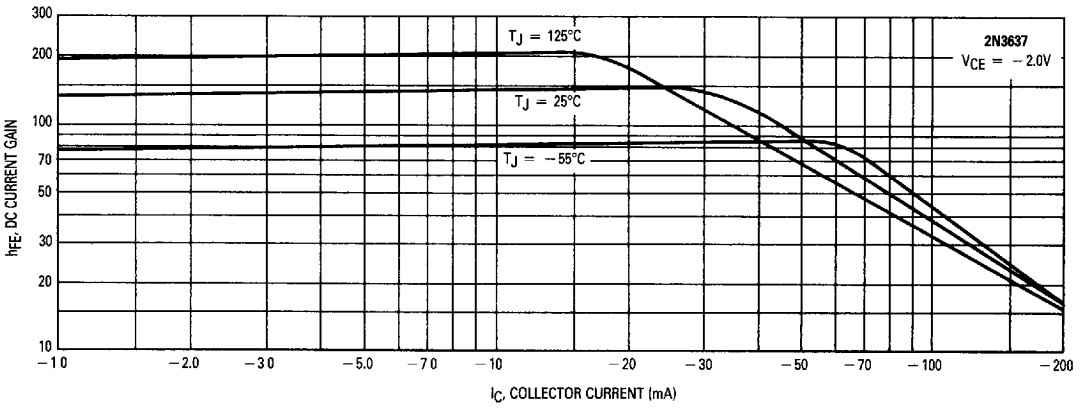


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FIGURE 6 — CURRENT GAIN CHARACTERISTICS versus COLLECTOR EMITTER VOLTAGE

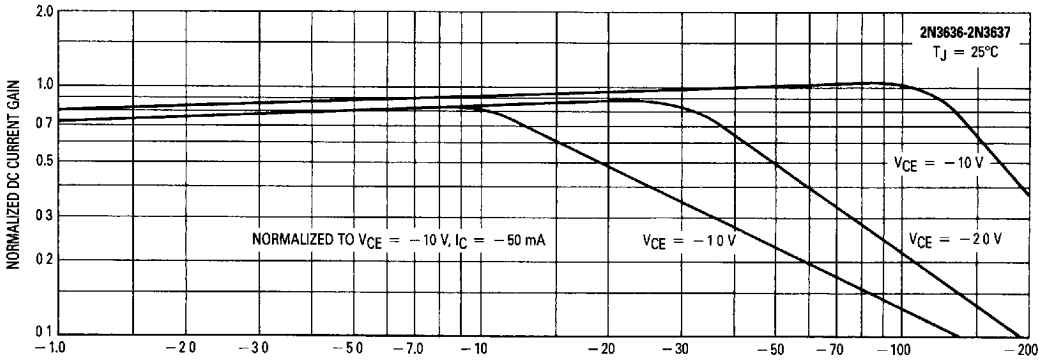

FIGURE 7 — INPUT IMPEDANCE

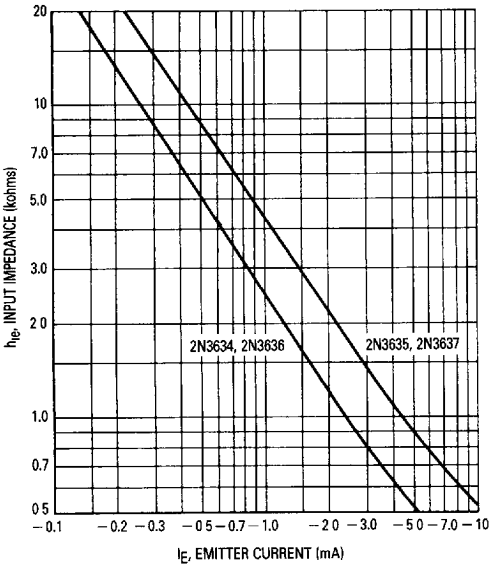

FIGURE 8 — OUTPUT IMPEDANCE

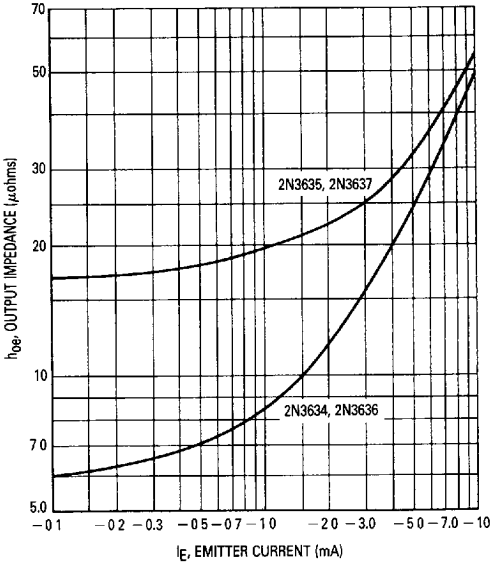

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FIGURE 9 — CURRENT GAIN

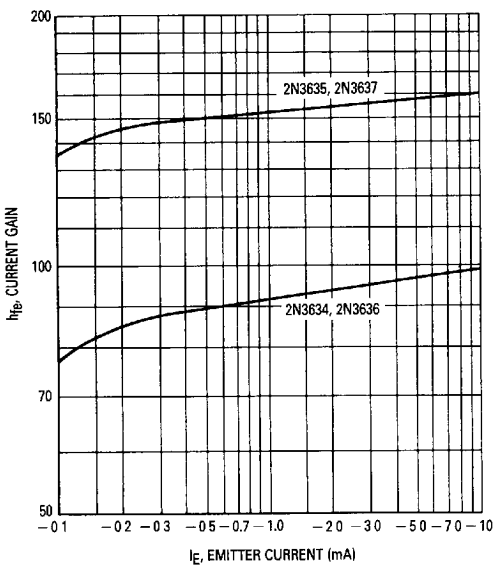


FIGURE 10 — VOLTAGE FEEDBACK RATIO

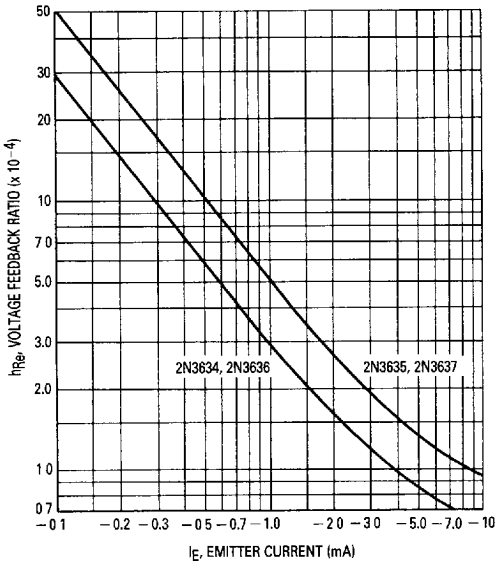


FIGURE 11 — SATURATION VOLTAGES

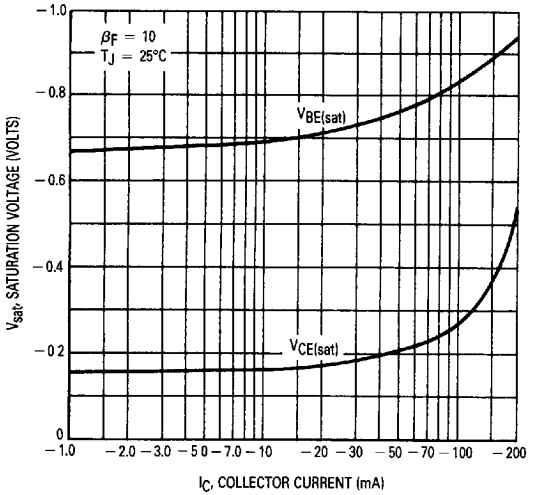


FIGURE 12 — TEMPERATURE COEFFICIENTS

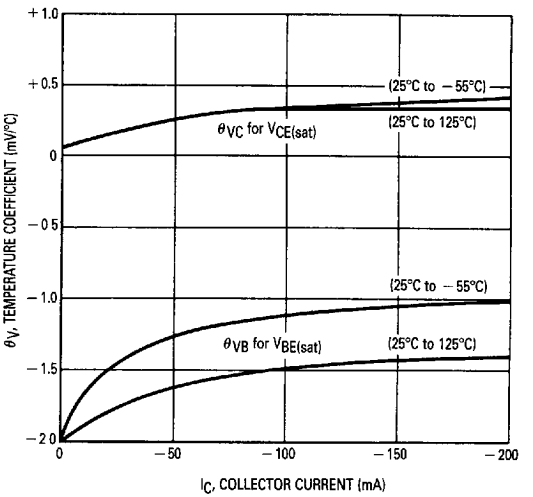
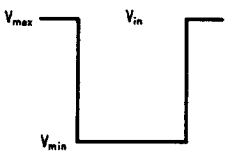


FIGURE 13 — SWITCHING TIME TEST CIRCUIT



P.W. ≅ 20 μs
DUTY CYCLE ≦ 2%
RISE TIME ≦ 20 ns

	V_{max}	V_{min}
TURN-ON	+4.0 V	−5.65 V
TURN-OFF	+4.1 V	−5.9 V

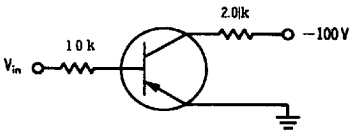


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FIGURE 14 — TURN-ON TIME VARIATIONS WITH VOLTAGE

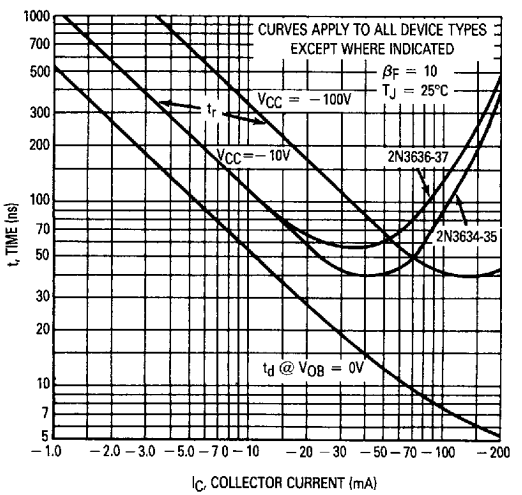

FIGURE 15 — TURN-OFF TIME VARIATIONS WITH CIRCUIT GAIN